



## Complete Summary

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### TITLE

Accidental puncture or laceration (area-level): rate per 100,000 population.

### SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 3]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Jan 17. Various p.(AHRQ Pub; no. 03-R203).

## Brief Abstract

### DESCRIPTION

This measure is used to assess the number of cases of technical difficulty (e.g., accidental cut or laceration during procedure) per 100,000 population.

### RATIONALE

Hospitals in the United States provide the setting for some of life's most pivotal events - the birth of a child, major surgery, treatment for otherwise fatal illnesses. These hospitals house the most sophisticated medical technology in the world and provide state-of-the-art diagnostic and therapeutic services. But access to these services comes with certain costs. About 36% of personal health care expenditures in the United States go towards hospital care, and the rate of growth in spending for hospital services has begun to increase following a half a decade of declining growth. Simultaneously, concerns about the quality of health care services have reached a crescendo with the Institute of Medicine's series of reports describing the problem of medical errors and the need for a complete restructuring of the health care system to improve the quality of care. Policymakers, employers, and consumers have made the quality of care in U.S. hospitals a top priority and have voiced the need to assess, monitor, track, and improve the quality of inpatient care.

Widespread consensus exists that health care organizations can reduce patient injuries by improving the environment for safety from implementing technical changes, such as electronic medical record systems, to improving staff awareness of patient safety risks. Clinical process interventions also have strong evidence for reducing the risk of adverse events related to a patient's exposure to hospital care. Patient Safety Indicators (PSIs), which are based on computerized hospital discharge abstracts from the AHRQ's Healthcare Cost and Utilization Project (HCUP), can be used to better prioritize and evaluate local and national initiatives. Analyses of these and similar inexpensive, readily available administrative data

sets may provide a screen for potential medical errors and a method for monitoring trends over time.

The Accidental Puncture or Laceration indicator is intended to flag cases of complications that arise due to technical difficulties in medical care--specifically, those involving an accidental puncture or laceration (see the related National Quality Measures Clearinghouse [NQMC] summary of the Agency for Healthcare Research and Quality [AHRQ] indicator [Accidental puncture or laceration \(provider-level\): rate per 1,000 discharges](#)).

#### PRIMARY CLINICAL COMPONENT

Accidental puncture/laceration

#### DENOMINATOR DESCRIPTION

Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

#### NUMERATOR DESCRIPTION

Discharges with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code\* denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in any diagnosis field (principal or secondary) of all medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs)\*

Exclude obstetrical patients in Major Diagnostic Category 14 (MDC 14).

\*Refer to Appendix A of the original measure documentation for ICD-9-CM codes and DRGs.

### Evidence Supporting the Measure

#### PRIMARY MEASURE DOMAIN

Outcome

#### SECONDARY MEASURE DOMAIN

Not applicable

#### EVIDENCE SUPPORTING THE MEASURE

A formal consensus procedure involving experts in relevant clinical, methodological, and organizational sciences  
One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

## Evidence Supporting Need for the Measure

### NEED FOR THE MEASURE

Use of this measure to improve performance  
Wide variation in quality for the performance measured

### EVIDENCE SUPPORTING NEED FOR THE MEASURE

Agency for Healthcare Research and Quality (AHRQ). National healthcare quality report. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 Dec. 112 p.

AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 3]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Jan 17. Various p.(AHRQ Pub; no. 03-R203).

## State of Use of the Measure

### STATE OF USE

Current routine use

### CURRENT USE

Federal health policymaking  
National health care quality reporting  
State health policymaking

## Application of Measure in its Current Use

### CARE SETTING

Hospitals

### PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Physicians  
Public Health Professionals

### LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Counties or Cities

### TARGET POPULATION AGE

Unspecified

### TARGET POPULATION GENDER

Either male or female

## STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

### Characteristics of the Primary Clinical Component

#### INCIDENCE/PREVALENCE

Population Rate (2002): 36.79 per 100,000 population at risk.

#### EVIDENCE FOR INCIDENCE/PREVALENCE

AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 3]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Jan 17. Various p.(AHRQ Pub; no. 03-R203).

#### ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

#### BURDEN OF ILLNESS

Unspecified

#### UTILIZATION

Unspecified

#### COSTS

Unspecified

### Institute of Medicine National Healthcare Quality Report Categories

#### IOM CARE NEED

Getting Better

#### IOM DOMAIN

Safety

### Data Collection for the Measure

#### CASE FINDING

Both users and nonusers of care

#### DESCRIPTION OF CASE FINDING

Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

#### DENOMINATOR SAMPLING FRAME

Geographically defined

#### DENOMINATOR (INDEX) EVENT

Patient Characteristic

#### DENOMINATOR INCLUSIONS/EXCLUSIONS

##### Inclusions

Population of county or Metropolitan Statistical Area (MSA) associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

##### Exclusions

Unspecified

#### NUMERATOR INCLUSIONS/EXCLUSIONS

##### Inclusions

Discharges with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code\* denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in any diagnosis field (principal or secondary) of all medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs)\*

\*Refer to Appendix A of the original measure documentation for ICD-9-CM codes and DRGs.

##### Exclusions

Exclude obstetrical patients in Major Diagnostic Category 14 (MDC 14).

#### DENOMINATOR TIME WINDOW

Time window is a single point in time

#### NUMERATOR TIME WINDOW

Institutionalization

#### DATA SOURCE

Administrative data  
National public health data

#### LEVEL OF DETERMINATION OF QUALITY

Not Individual Case

#### OUTCOME TYPE

Adverse Outcome

#### PRE-EXISTING INSTRUMENT USED

Unspecified

### Computation of the Measure

#### SCORING

Rate

#### INTERPRETATION OF SCORE

Better quality is associated with a lower score

#### ALLOWANCE FOR PATIENT FACTORS

Unspecified

#### STANDARD OF COMPARISON

External comparison at a point in time  
External comparison of time trends  
Internal time comparison

### Evaluation of Measure Properties

#### EXTENT OF MEASURE TESTING

The Patient Safety Indicators (PSIs) were evaluated by the project team using empirical analyses to explore the frequency and variation of the indicators, the potential bias, based on limited risk adjustment, and the relationship between indicators. The data sources used in the empirical analyses were the 1997 Florida State Inpatient Database (SID) for initial testing and development and the 1997 Healthcare Cost and Utilization Project (HCUP) State Inpatient Database for 19 States for the final empirical analyses.

All potential indicators were examined empirically by developing and conducting statistical tests for precision, bias, and relatedness of indicators. Three different estimates of hospital performance were calculated for each indicator:

1. The raw indicator rate was calculated using the number of adverse events in the numerator divided by the number of discharges in the population at risk by hospital.
2. The raw indicator was adjusted to account for differences among hospitals in age, gender, modified Diagnosis-Related Group (DRG), and comorbidities.
3. Multivariate signal extraction methods were applied to adjust for reliability by estimating the amount of "noise" (i.e., variation due to random error) relative to the amount of "signal" (i.e., systematic variation in hospital performance or reliability) for each indicator.

The project team constructed a set of statistical tests to examine the precision, bias, and relatedness of indicators for all accepted Provider-level Indicators, and precision and bias for all accepted Area-level Indicators. It should be noted that rates based on fewer than 30 cases in the numerator or the denominator are not reported.

The project team conducted a structured review of each indicator to evaluate the face validity (from a clinical perspective) of the indicators. The methodology for the structured review was adapted from the RAND/UCLA Appropriateness Method and consisted of an initial independent assessment of each indicator by clinician panelists using an initial questionnaire, a conference call among all panelists, followed by a final independent assessment by panelists using the same questionnaire. The review sought to establish consensual validity, which "extends face validity from one expert to a panel of experts who examine and rate the appropriateness of each item..." The panel process served to refine definitions of some indicators, add new measures, and dismiss indicators with major concerns from further consideration.

Refer to the original measure documentation for additional details.

## EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 3]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Jan 17. Various p.(AHRQ Pub; no. 03-R203).

### Identifying Information

#### ORIGINAL TITLE

Accidental puncture or laceration (area level definition) (PSI 25).

#### MEASURE COLLECTION

[Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators](#)

#### MEASURE SET NAME

[Agency for Healthcare Research and Quality \(AHRQ\) Patient Safety Indicators](#)

DEVELOPER

Agency for Healthcare Research and Quality

INCLUDED IN

National Healthcare Quality Report (NHQR)

ADAPTATION

This indicator was originally proposed by Iezzoni and colleagues (1994) as part of the Complications Screening Program (CSP), although unlike the final Patient Safety Indicator (PSI), its codes were split between two CSP indicators (CSP 27, "technical difficulty with medical care," and "sentinel events"). It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in the Agency for Healthcare Research and Quality's (AHRQ's) original Healthcare Cost and Utilization Project (HCUP) Quality Indicators (Elixhauser et al., 1998). The University HealthSystem Consortium adopted CSP 27 as an indicator for medical (#2806) and major surgery (#2956) patients. Miller and colleagues (2001) also split this set of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes into two broader indicators ("miscellaneous misadventures" and "E codes") in the original "AHRQ PSI Algorithms and Groupings." Based on expert consensus panels, McKesson Health Solutions included one component of this PSI (Accidental Puncture or Laceration) in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module.

RELEASE DATE

2003 Mar

REVISION DATE

2005 Jan

MEASURE STATUS

This is the current release of the measure.

This measure updates a previous version: AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 May 28. 143 p. (AHRQ Pub; no. 03-R203).

SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [version 2.1, revision 3]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Jan 17. Various p. (AHRQ Pub; no. 03-R203).



## MEASURE AVAILABILITY

The individual measure, "Accidental Puncture or Laceration (Area Level Definition) (PSI 25)," is published in "AHRQ Quality Indicators. Guide to Patient Safety Indicators." This document is available in [Portable Document Format \(PDF\)](#) and a [zipped Word\(R\) file](#) from the [Quality Indicators](#) page at the Agency for Healthcare Research and Quality (AHRQ) Web site.

For more information, please contact the QI Support Team at [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov).

## COMPANION DOCUMENTS

The following are available:

- AHRQ Quality Indicators - patient safety indicators: software documentation [version 2.1, revision 3a] - SAS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Feb 15. 45 p. (AHRQ Pub; no. 03-R204). This document is available from the [Agency for Healthcare Research and Quality \(AHRQ\) Web site](#).
- AHRQ Quality Indicators - patient safety indicators: software documentation [version 2.1, revision 3a] - SPSS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Feb 15. 39 p. (AHRQ Pub; no. 03-R205). This document is available from the [AHRQ Web site](#).
- Remus D, Fraser I. Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available from the [AHRQ Web site](#).
- HCUPnet, Healthcare Cost and Utilization Project. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 [Various pagings]. HCUPnet is available from the [AHRQ Web site](#).
- UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. (Technical review; no. 4). This document is available from the [AHRQ Web site](#).

## NQMC STATUS

This NQMC summary was completed by ECRI on October 1, 2003. The information was verified by the measure developer on October 29, 2003. This summary was updated by ECRI on February 7, 2005. The information was verified by the measure developer on April 25, 2005.

## COPYRIGHT STATEMENT

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